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EXAMINER	
SINGH, DALZID E	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/751,421	FUSE ET AL.	
	Examiner	Art Unit	
	Dalzid Singh	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *62-80* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *62-64,66-74,76-78 and 80* is/are rejected.

7)☒ Claim(s) *65,75 and 79* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/136,934.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *06 January 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 62-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe (US Patent No. 5,896,211) in view of Naito et al (US Patent No. 5,568,305).

Regarding claim 62, Watanabe discloses optical communication system, as shown in Fig. 13, comprising:

an interference portion operable to separate a signal including at least a portion of an optical modulated signal into a plurality of optical signals having predetermined difference in propagation delay and to then combine the optical signals (the interference portion split the optical signal into part A and part B, wherein part B is delayed by a predetermined amount); and

an optical/electrical converting portion (104) operable to convert the combined optical signals into an electrical signal.

Watanabe discloses an optical/electrical converting portion, as discussed above, and differ from the claimed invention in that Watanabe does not disclose that the optical/electrical converting portion having square-law-detection characteristics. However, in optical reception circuit it is well known to provide optical/electrical converter having square-law detection characteristics. Naito et al is cited to show such

well known concept. In col. 1, lines 29-34, Naito et al disclose photodiode used in optical communication system having square-law detection. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the optical/electrical converter of Watanabe with that of Naito et al. One of ordinary skill in the art would have been motivated to do such in order to obtain maximum detection of the optical signal.

Regarding claim 63, as discussed above, as shown in Fig. 13, the system is operable to receive the optical-modulated signal and to acquire a demodulated signal of the optical modulated signal, wherein said interference portion and said optical/electrical converting portion constitute a delayed detection system of an optical signal, and wherein said delayed detection system is operable to simultaneously perform conversion processing of an optical signal into an electrical signal and angle demodulation processing (on page 2, of the specification, applicant indicated that angle modulation includes FM, PM, FSK or PSK modulation schemes; in col. 5, lines 9-17, Watanabe discloses FM, PM, FSK or PSK modulation, therefore it would have been obvious that demodulation of such modulation scheme is performed at the receiver end in order to obtained the data signal).

Regarding claim 64, as shown in Fig. 5, Watanabe shows the optical modulated signal is generated from a 2^n-phase PSK electrical-modulated signal as an original signal, wherein n is an integer of not less than two, wherein said interference portion (shown in Fig. 13) includes a received light dividing portion (81) and first to 2^{n-1} optical interference circuits (91-1, 91-2 to 91-k), wherein said received light dividing portion is

operable to divide an inputted optical signal into 2^{n-1} received lights, wherein said first to 2^{n-1} optical interference circuits, provided corresponding to the 2^{n-1} received lights respectively, are operable to branch each of the received lights into a first optical signal and a second optical signal, to provide the second optical signal with a predetermined delay and then to combine the first and second optical signals, and wherein the optical/electrical signals are provided corresponding to said first to 2^{n-1}th optical interference circuits respectively (the interference circuit which divides the optical signal into portion A and delayed portion B).

Regarding claim 66, as shown in Fig. 5, Watanabe shows an optical modulating portion (41-1 to 41-k) operable to convert an angle-modulated signal (ASK, FSK, PSK, AM, FM and PM) into the optical-modulated signal; and an optical branch portion ((81) shown in Fig. 13) operable to branch the optical-modulated signal outputted from said optical modulating portion into at least two signals, a first optical-modulated signal and a second optical-modulated signal, wherein said interference portion is operable to separate the first optical-modulated signal outputted from said optical branch portion into a plurality of optical signals having predetermined difference in propagation delay and then combining the optical signals (portion A and portion B), wherein said optical/electrical converting portion comprises a first optical/electrical converting portion and a second optical/electrical converting portion (each element (91-1 to 91-k) comprise optical/electrical converting portion to convert the optical signal into electrical signal).

Watanabe discloses an optical/electrical converting portion, as discussed above, and differ from the claimed invention in that Watanabe does not disclose that the

optical/electrical converting portion having square-law-detection characteristics. However, in optical reception circuit it is well known to provide optical/electrical converter having square-law detection characteristics. Naito et al is cited to show such well known concept. In col. 1, lines 29-34, Naito et al photodiode used in optical communication system having square-law detection. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the optical/electrical converter of Watanabe with that of Naito et al. One of ordinary skill in the art would have been motivated to do such in order to obtain maximum detection of the optical signal.

Regarding claim 67, in Fig. 16, Watanabe shows a local light source (Lo-LD2) operable to output a light of a predetermined wavelength; and an optical combining portion, inserted between said optical branch portion (121) and said second optical/electrical converting portion, operable to combine the second optical-modulated signal outputted from said optical branch portion and the light from said local light source, wherein said second optical/electrical converting portion is operable to heterodyne detect the combined optical signal outputted from said optical combining portion and then to convert the optical signal into an electrical signal.

Regarding claim 68, in Fig. 17, Watanabe shows a local light source (45) operable to output a light of a predetermined wavelength; and an optical combining portion (46), inserted between said optical modulating portion (43) and said optical branch portion (47), operable to combine the optical-modulated signal outputted from said optical modulating portion and the light from said local light source, wherein said

second optical/electrical converting portion (48) is operable to heterodyne detect the second optical-modulated signal outputted from said optical branch portion and the optical-modulated signal into an electrical signal.

Regarding claim 69 (as far as understood), in Fig. 10, Watanabe shows an optical modulating portion (33) operable to convert an angle-modulated signal (ASK, FSK, PSK, AM, FM and PM) into an optical-modulated signal;

a local light source (72) operable to output a light of a predetermined wavelength; an optical combining portion operable to combine the optical-modulated signal outputted from said optical modulating portion and the light from said local light source; and

wherein said interference portion is operable to separate the combined optical signal outputted from said optical combining portion into a plurality of optical signals having predetermined difference in propagation delay and then to combine the optical signals (the interference portion split the optical signal into part A and part B, wherein part B is delayed by a predetermined amount).

The combination of Watanabe and Naito et al differs from the claimed invention in that the combination does not specifically disclose dividing portion operable to separate the electrical signal. However, it would have been obvious to an artisan of rodinary skill in the art to provide dividing portion to separate the electrical signal. For example, such dividing portion could be placed after the discriminator circuit (91-1) of Watanabe. One of ordinary skill in the art would have been motivated to do such in order to provide the same electrical signal to different receivers.

Regarding claim 70, as shown in Fig. 16, Watanabe shows an optical modulating portion (31-1 to 31-k) operable to convert an angle-modulated signal into an optical-modulated signal;

an optical branch portion (121) operable to branch the optical-modulated signal outputted from said optical modulating portion into at least two signals, a first optical-modulated signal and a second optical-modulated signal; and

a local oscillation portion (Lo-LD1) operable to convert an unmodulated signal of a predetermined frequency,

an interference portion operable to separate a signal including at least a portion of an optical modulated signal into a plurality of optical signals having predetermined difference in propagation delay and to then combine the optical signals (the interference portion split the optical signal into part A and part B, wherein part B is delayed by a predetermined amount); and

an optical/electrical converting portion (104) operable to convert the combined optical signals into an electrical signal.

Watanabe discloses an optical/electrical converting portion, as discussed above, and differ from the claimed invention in that Watanabe does not disclose that the optical/electrical converting portion having square-law-detection characteristics. However, in optical reception circuit it is well known to provide optical/electrical converter having square-law detection characteristics. Naito et al is cited to show such well known concept. In col. 1, lines 29-34, Naito et al photodiode used in optical communication system having square-law detection. Therefore, it would have been

obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the optical/electrical converter of Watanabe with that of Naito et al. One of ordinary skill in the art would have been motivated to do such in order to obtain maximum detection of the optical signal.

Regarding claim 71, as shown in Fig. 16, Watanabe shows an optical modulating portion (31-1 to 31-k) operable to convert an angle-modulated signal into an optical-modulated signal;

an optical branch portion (121) operable to branch the optical-modulated signal outputted from said optical modulating portion into at least two signals, a first optical-modulated signal and a second optical-modulated signal; and

a local oscillation portion (Lo-LD1) operable to output an unmodulated signal of a predetermined frequency; and

a mixing portion, wherein an interference portion operable to separate a signal including at least a portion of an optical modulated signal into a plurality of optical signals having predetermined difference in propagation delay and to then combine the optical signals (the interference portion split the optical signal into part A and part B, wherein part B is delayed by a predetermined amount); and

an optical/electrical converting portion (104) operable to convert the combined optical signals into an electrical signal.

Watanabe discloses an optical/electrical converting portion, as discussed above, and differ from the claimed invention in that Watanabe does not disclose that the optical/electrical converting portion having square-law-detection characteristics.

However, in optical reception circuit it is well known to provide optical/electrical converter having square-law detection characteristics. Naito et al is cited to show such well known concept. In col. 1, lines 29-34, Naito et al photodiode used in optical communication system having square-law detection. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the optical/electrical converter of Watanabe with that of Naito et al. One of ordinary skill in the art would have been motivated to do such in order to obtain maximum detection of the optical signal.

Regarding claim 72, in Fig. 16 Watanabe shows an angle modulating portion (ASK, FSK, PSK, AM, FM AND PM) operable to convert a first electrical signal into an angle-modulated signal;

a combining portion (31-1 to 31-k) operable to combine the angle-modulated signal and a second electrical signal (f1 to fk);

an optical modulating portion (33) operable to convert the combined signal outputted from said combining portion into an optical modulated signal; and

an optical branch portion ((81 shown in Fig. 13) operable to branch the optical modulated signal outputted from said optical modulating portion into at least two signals, a first optical-modulated signal and a second optical-modulated signal, wherein said interference portion is operable to branch the first optical modulated signal outputted from said optical branch portion into a plurality of optical signals (portion A and portion B) having predetermined difference in propagation delay and then to combine the optical signals, wherein said optical/electrical converting portion (104) comprises a first

optical/electrical converting portion and a second optical/electrical converting portion, wherein said first optical/electrical converting portion.

Watanabe discloses an optical/electrical converting portion, as discussed above, and differ from the claimed invention in that Watanabe does not disclose that the optical/electrical converting portion having square-law-detection characteristics. However, in optical reception circuit it is well known to provide optical/electrical converter having square-law detection characteristics. Naito et al is cited to show such well known concept. In col. 1, lines 29-34, Naito et al photodiode used in optical communication system having square-law detection. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the optical/electrical converter of Watanabe with that of Naito et al. One of ordinary skill in the art would have been motivated to do such in order to obtain maximum detection of the optical signal.

Regarding claim 73, as shown in Fig. 8 and 9, Watanabe shows that the occupied frequency band of the first electrical signal, an occupied frequency band of the second electrical signal and an occupied frequency band of the angle-modulated signal do not overlap with each other.

Regarding claim 74, as shown in Fig. 13, Watanabe shows that a first signal processing portion (91-1) operable to limit the occupied frequency band of the first electrical signal; and a second signal processing portion (91-2) operable to limit the occupied frequency band of the second electrical signal.

Regarding claim 76, as shown in Fig. 10, Watanabe shows a plurality of angle modulating portions (ASK, FSK, PSK, AM, FM and PM) operable to convert each of a plurality of electrical signals into angle-modulated signals;

a combining portion (31-1 to 31-k) operable to combine the angle-modulated signals outputted from said plurality of angle modulating portions;

an optical modulating portion (33) operable to convert the combined signal outputted from said combining portion into an optical-modulated signal;

an optical branch portion ((81 shown in Fig. 13) operable to branch the optical modulated signal outputted from said optical modulating portion into at least two signals, a first optical-modulated signal and a second optical-modulated signal, wherein said interference portion is operable to branch the first optical modulated signal outputted from said optical branch portion into a plurality of optical signals (portion A and portion B) having predetermined difference in propagation delay and then to combine the optical signals, wherein said optical/electrical converting portion (104) comprises a first optical/electrical converting portion and a second optical/electrical converting portion, wherein said first optical/electrical converting portion.

Watanabe discloses an optical/electrical converting portion, as discussed above, and differ from the claimed invention in that Watanabe does not disclose that the optical/electrical converting portion having square-law-detection characteristics. However, in optical reception circuit it is well known to provide optical/electrical converter having square-law detection characteristics. Naito et al is cited to show such well known concept. In col. 1, lines 29-34, Naito et al photodiode used in optical

communication system having square-law detection. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the optical/electrical converter of Watanabe with that of Naito et al. One of ordinary skill in the art would have been motivated to do such in order to obtain maximum detection of the optical signal.

Regarding claim 77, as shown in Fig. 8 and 9, Watanabe shows that the occupied frequency bands of the plurality of electrical signals and occupied frequency bands of the plurality of angle-modulated signals do not overlap with each other.

Regarding claim 78, as shown in Fig. 10, Watanabe shows plurality of signal pre-processing portions (36-1 to 36k) operable to limit the occupied frequency bands of the plurality of electrical signals.

Regarding claim 80, as shown in Fig. 10, Watanabe shows an optical modulating portion (33) operable to convert a multichannel angle-modulated signal into an optical-modulated signal;

an optical branch portion ((81 shown in Fig. 13) operable to branch the optical modulated signal outputted from said optical modulating portion into at least two signals, a first optical-modulated signal and a second optical-modulated signal, wherein said interference portion is operable to branch the first optical modulated signal outputted from said optical branch portion into a plurality of optical signals (portion A and portion B) having predetermined difference in propagation delay and then to combine the optical signals, wherein said optical/electrical converting portion (104) comprises a first

optical/electrical converting portion and a second optical/electrical converting portion, wherein said first optical/electrical converting portion.

Watanabe discloses an optical/electrical converting portion, as discussed above, and differ from the claimed invention in that Watanabe does not disclose that the optical/electrical converting portion having square-law-detection characteristics. However, in optical reception circuit it is well known to provide optical/electrical converter having square-law detection characteristics. Naito et al is cited to show such well known concept. In col. 1, lines 29-34, Naito et al photodiode used in optical communication system having square-law detection. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the optical/electrical converter of Watanabe with that of Naito et al. One of ordinary skill in the art would have been motivated to do such in order to obtain maximum detection of the optical signal.

Allowable Subject Matter

3. Claims 65, 75 and 79 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Watanabe (US Patent No. 5,432,632) is cited to show optical communication system.

Maeda et al (US Patent No. 5,825,518) is cited to show optical transmission unit.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (571) 272-3029. The examiner can normally be reached on Mon-Fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272--3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DS
September 2, 2005
Dalzid Singh